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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SIKORSKY AIRCRAFT CORPORATION

Appeal 2009-0814
Application 10/676,775
Technology Center 3600

Decided[1]: April 29, 2009

Before RICHARD E. SCHAFER, JAMESON LEE, and SALLY C. MEDLEY, *Administrative Patent Judges*.

LEE, *Administrative Patent Judge*.

DECISION ON APPEAL

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[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

A. STATEMENT OF THE CASE

This is a decision on appeal by the real party in interest, Sikorsky Aircraft Corporation (SAC), under 35 U.S.C. § 134(a) from a final rejection of claims 1, 2, 4, 5, 7, 23, and 24. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

Reference Relied on by the Examiner

Kanski	2,309,172	Jan. 26, 1943

The Rejections on Appeal

The Examiner rejected claims 1, 2, 4, 5, 7, 23, and 24 under 35 U.S.C. § 102(b) as anticipated by Kanski.

The Invention

The invention relates to a force generator for producing large, controllable, vibratory forces to compensate for sensed noise or vibrations. (Spec. 1: ¶ 1.)

SAC's Figure 2A is reproduced below:

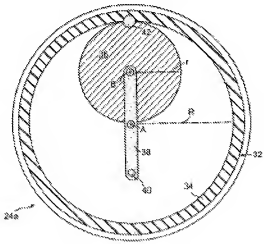


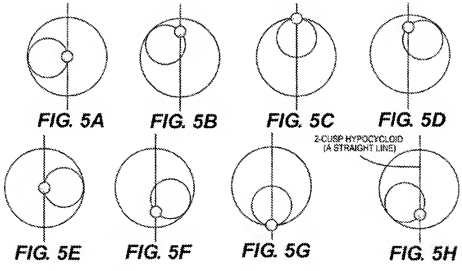
FIG. 2A

Figure 2A depicts a general face view of a force generator according to SAC's invention. (Spec. 2: ¶ 11.)

SAC's specification describes a first outer circular member 32 and a second inner circular member 36. (Spec. 4: ¶¶ 29 and 30.) A mass 42 is arranged on the circumference of the second inner circular member 36. (Spec. 4: ¶ 31.) SAC's specification further discloses that (Spec. 5: ¶ 49):

> If the second circular member 36 diameter is exactly one half of the first circular member 32 diameter, a point on the circumference of the second circular member 36 creates a two cusp hypocycloid which is a straight line…The mass 42 which is located at point p on the circumference will therefore generate a sinusoidal inertial force in a straight line (further illustrated in Figures 5a-5h).

SAC's Figures 5A-5H are reproduced below:



Figures 5A-5H depict a schematic sequence illustrating movement of a mass in a straight line as an inner circular member rolls within an outer circular member. (Spec. 2: ¶ 15.)

Independent claim 1 is reproduced below (Claims App'x 12:1-13):

1. A force generator comprising:

a rotationally fixed first circular member defined about a first axis to define a first inner diameter circular path, said first circular member having a first radius;

a second circular member defined about a second axis offset from said first axis to define a second radius, said second radius one-half the radius of said first radius, said second circular member movable about the circular path to simultaneously complete one revolution about said second axis and one orbit around said first axis;

a crank which mounts said second circular member, said crank rotatable about said first axis; and

a mass located adjacent a circumference of said second circular member movable about a two-cusp hypocycloid path to generate a vibratory inertial force, to minimize a vibratory force.

B. ISSUES

1. Has SAC shown that the Examiner erred in finding that Kanski discloses a first circular member that is "rotationally fixed"?

2. Has SAC shown that the Examiner erred in finding that Kanski discloses a second circular member that moves along "a two-cusp hypocycloid path"?

C. FINDINGS OF FACT

1. SAC's specification defines a two-cusp hypocycloid as "a straight line." (Spec. 2: ¶ 7; 5: ¶ 49; fig. 5H.)

2. Kanski discloses a vibration processing machine for obtaining complex vibratory motion. (Kanski p. 1, col. 1, ll. 1-9.)

3. Kanski's Figure 1 is reproduced below:

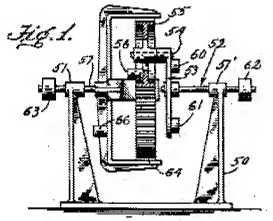


Figure 1 shows a diagrammatic representation of a vibration machine including an outer "orbit" gear 64, an inner "planetary" gear 55, and a mass-center 56. (Kanski p. 1, col. 1, ll. 37-38; p. 2, col. 2, ll. 15-20.)

4. Kanski's Figure 2 is reproduced below:

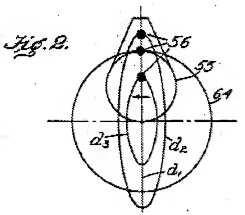


Figure 2 depicts the motion of mass-center 56 when the gear ratio of gear 55 to gear 64 is 1:2. (Kanski p. 3, col. 1, ll. 65-71.)

5. Kanski discloses that (Kanski p. 3, col. 1, ll. 67-71):

> If in the arrangement of Fig. 2, the active mass-center 56 be placed on the pitch radius of the planet-gear, we obtain a straight-line motion (d_1) identical in all respects to the simple harmonic motion.

6. Gear 64 is carried on shaft member 57. (Kanski p. 4, col. 2, ll. 27-29; fig. 1)

7. In some operative modes of Kanski's vibration machine, shaft member 57 is "kept stationary" while gear 55 rotates. (Kanski p. 2, col. 2, ll. 15-36; p. 4, col. 2, ll. 1-4.)

8. SAC explains in its Appeal Brief that: "a two-cusp hypocycloid path would be unachievable were the first circular member not 'rotationally fixed.'" (App. Br. 9:10-12.)

D. PRINCIPLES OF LAW

Anticipation under 35 U.S.C. § 102 is established when all the elements of a claim are found in a single prior art reference and arranged as recited in the claim. *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001).

E. ANALYSIS

The Examiner rejected claims 1, 2, 4, 5, 7, 23, and 24 as anticipated by Kanski. SAC argues claims 2, 4, 5, 7, 23, and 24 collectively with claim 1. We focus on the disputed limitations.

SAC disputes that Kanski discloses a first circular member that is "rotationally fixed." SAC also disputes that Kanski discloses a second circular member that moves in "a two-cusp hypocycloid path."

The Examiner found that Kanski discloses each of "a rotationally fixed first circular member 64 defined about a first axis (about shaft 52)..." and "a second circular member 55 defined about a second axis (about element 54)..." (Ans. 3: 4-7.) The Examiner determined that Kanski's first circular member 64 is "rotationally fixed" because (Ans. 4:15-19):

> Kanski discloses, in Figs. 1-2, and on page 5, in the first column, lines 23-26, that the "(m)ember 52 may be rotated while member 63 is kept stationary." The first circular member 64 is connected to the member 63 and the second circular member 55 is connected to the member 52. As the member 52 rotates, the second circular member 55 rotates relative to the first circular member 64.

The Examiner further explained that (Ans. 5:1-5):

> As the second circular member 55 rotates about the first circular member 64, a path (d sub 1 in Fig. 2) of a two-cusp hypocycloid is created. Such path is the straight line that defines the up and down movement of the mass 56 when the mass 56 is located at the point where the first and second circular members meet as shown in Fig. 2 (see page 6, first column, lines 10-15).

Thus, the Examiner determined that when Kanski's first circular member 64 is stationary while second circular member 55 rotates, first circular member 64 is "rotationally fixed." The Examiner further determined that the resulting motion of mass 56 is in a straight line and satisfies the requirement of motion in a "two-cusp hypocycloid path."

We first address SAC's argument that in Kanski "none of the schematics illustrate a two-cusp hypocycloid." (Reply Br. 3: 20-21.)

The argument is unpersuasive. SAC's specification defines a two-cusp hypocycloid as "a straight line." (Spec. 2: ¶ 7; 5: ¶ 49; fig. 5H.)

Kanski's Figures 1 and 2 are reproduced below:

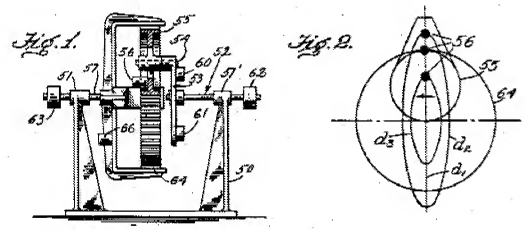


Figure 1 shows a diagrammatic representation of a vibration machine including an outer "orbit" gear 64, an inner "planetary" gear 55, and a mass-center 56. (Kanski p. 1, col. 1, ll. 37-38; p. 2, col. 2, ll. 15-20.) Figure 2 depicts the motion of mass-center 56 when the gear ratio of gear 55 to gear 64 is 1:2. (Kanski p. 3, col. 1, ll. 65-71.)

As explained in Kanski (Kanski p. 3, col. 1, ll. 67-71):

> If in the arrangement of Fig. 2, the active mass-center 56 be placed on the pitch radius of the planet-gear, we obtain a straight-line motion (d_1) identical in all respects to the simple harmonic motion.

Thus, the motion of mass-center 56 along the path d_1 is a straight line, which, in the context of SAC's specification, is "a two-cusp hypocycloid path." SAC does not explain why Kanski's straight-line path d_1 is not a two-cusp hypocycloid path.

Turning to the "rotationally fixed" requirement, SAC argues that Kanski's first circular member 64 is not "rotationally fixed" because (Reply Br. 2:21-3:3):

> *Kanski* discloses at least two rotatable members 57 and 52. Member 57 carries a concentric gear 58 (in Figures 1A and 1B) or an internal gear (orbit) 64 (in Figure 1). [Copy of Kanski's Figure 1 omitted]

> Notably, members 62 and 63 may be driven by a motor with different velocities and direction of rotation such that rotatable member 57 and thus internal gear 64 rotates contrary to the Examiner's interpretation.

SAC points to Kanski at page 4, lines 24-39 in support of its argument. (Reply Br. 3: 3.)

It is not in dispute that "rotationally fixed" means without rotational motion. SAC argues that Kanski's gear 64 is not rotationally fixed because the gear is disclosed in one section of Kanski as being rotatable. Although it is true that in one disclosed embodiment gear 64 does rotate, Kanski discloses other embodiments in which gear 64 is rotationally fixed. Specifically, Kanski describes other modes of operation in which the shaft 57 that carries gear 64 is "kept stationary" while gear 55 rotates. (Kanski p. 2, col. 2, ll. 15-36; p. 4, col. 2, ll. 1-4.) That is, gear 55 rotates but gear 64 does not. In those operative modes, gear 64 is rotationally fixed.

Moreover, in its Brief, SAC states: "a two-cusp hypocycloid path would be unachievable were the first circular member not 'rotationally fixed.'" (App. Br. 9:10-12.) As discussed above, Kanski discloses that mass 56 moves in a straight line when the gear ratio of gear 55 to gear 64 is 1:2 and the mass is placed on the pitch radius of gear 55. In light of SAC's statement, Kanski's mass 56 would not be capable of moving in a straight line, i.e. a two-cusp hypocycloid path, unless gear 64 is rotationally fixed. It therefore necessarily follows that Kanski's disclosure must include an operative mode in which gear 64 is rotationally fixed. We reject SAC's argument that Kanski does not satisfy the "rotationally fixed" requirement of claim 1.

For the foregoing reasons, we sustain the rejection of claims 1, 2, 4, 5, 7, 23, and 24 as anticipated by Kanski.

F. CONCLUSION

1. SAC has not shown that the Examiner erred in finding that Kanski discloses a first circular member that is "rotationally fixed."

2. SAC has not shown that the Examiner erred in finding that Kanski discloses a second circular member that moves along "a two-cusp hypocycloid path."

G. ORDER

The rejection of claims 1, 2, 4, 5, 7, 23, and 24 under 35 U.S.C. § 102(b) as anticipated by Kanski is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

sss

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